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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/655,946	09/04/2003	Tong Xie	10030187-1	7020

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EXAMINER

GOKHALE, SAMEER K

ART UNIT	PAPER NUMBER
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2629

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/655,946	XIE ET AL.	
	Examiner	Art Unit	
	Sameer K. Gokhale	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-11 and 13-21 is/are rejected.
- 7) ☒ Claim(s) 3,12,and 22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 11, 19, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Liou (US 5,086,197).

Regarding claims 1 and 11, Liou teaches an apparatus and electronic device for optical navigation on a display screen (Fig. 1, item 11, where the grid pad displays the grid lines) comprising: a surface comprising an aperture (Fig. 2, the stylus depicted here has an aperture on the surface in contact with surface 11 so that light may reach inside the device), said surface configured to be moveable against an illuminated surface or a display screen (Fig. 2, see col. 2, lines 45-46, where the grid pad 11 is the illuminated surface and the display screen receiving the projected light) having a detectable texture (see Fig. 9, the grid lines on grid pad 11 constitute a detectable texture); an optical motion detection circuit integral to said apparatus (see col. 3, lines 29-32, or col. 4, lines 15-16) and optically coupled to said detectable texture of said illuminated surface (see col. 4, lines 33-35, where the grid pad 11 is optically coupled to the detection circuit because the movement of the lines on grid pad 11 are being tracked), said optical motion detection circuit comprising a single detector (see col. 3, lines 18, where the sensors 14, 14', 16, 16' constitute a single array, which is a single detector) for

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acquiring images of said surface at a specified rate (it is inherent that an image detector acquires images at a specified rate), said detector acquiring a single image at a time (Fig. 6, where a combination of images from sensor array 14, 14', 16, 16' constitutes a single image as shown in the figure), and comprising an image processor producing motion signals indicative of motion of said surface relative to said detectable texture of said illuminated surface (Fig. 6, see col. 4, lines 3-9), wherein said motion signals are produced by comparing two said images and comprise a change in location in a first axis and a change in location in a second axis (see col. 4, lines 3-9), wherein said optical motion detection circuit is operable to detect said detectable texture without requiring an integral illumination source (Fig. 1, see col. 2, line 52-54, and see col. 5, lines 64-68, where the having the light 10' below the surface with a translucent grid pad 11 is an option without requiring a light source inside the device.)

Regarding claim 2, Liou teaches an apparatus further comprising an optical element integral to said apparatus (Fig. 2, item 12), said optical element proximate said aperture (Fig. 2) and receiving light from said detectable texture of said illuminated surface (Fig. 2), said optical element operable to optically couple said optical motion detection circuit integral to said detectable texture of said illuminated surface (Fig. 2, the lens 12 transmits the image to the lenses 13 and 15, and then to the motion detection circuitry 14 and 16).

Regarding claim 19, Liou teaches a method for optical navigation on an illuminated surface using an electronic device, said method comprising: acquiring a first frame from said illuminated surface (Fig. 6E, where each capture 11 is a "frame") at a single detector (see col. 3, lines 18, where the sensors 14, 14', 16, 16' constitute a single array, which is a single detector) of said electronic device, such that said electronic device does not require an internal illumination source to provide illumination to said illuminated surface (Fig. 1, see col. 2, line 52-54, and see col. 5, lines 64-68, where the having the light 10' below the surface with a translucent grid pad 11 is an option without requiring a light source inside the device); acquiring a second frame at said single detector from said illuminated surface (Fig. 6F); determining a change in position in a first axis and in a second axis of said electronic device relative to said illuminated surface based on said first frame and said second frame (see col. 4, lines 3-9).

Regarding claim 20, Liou teaches a method wherein said determining a change in position comprises: computing correlation values for said first frame and said second frame (see col. 3, lines 46-65, where the values "1" and "0" assigned to the position of the device are correlation values), said correlation values indicating movement of said electronic device from said first frame to said second frame (see col. 3, lines 43-45); predicting a shift in position from said first frame based on said correlation values (see col. 3, lines 46-65, where the displacement signals described here a shift from the first

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frame 'A'); and outputting a motion signal indicating said shift in position (col. 3, lines 43-65, where the signals 'A'-'D' are motion signals indicating shift in position).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liou in view of Lauffenburger et al. (US 6,963,059) (hereafter, "Lauffenburger").

Regarding claim 4, Liou teaches an apparatus according to the limitations of claim 1 as discussed above, however Liou does not teach a supplemental light source operable to provide additional illumination onto said illuminated surface in response to said optical motion detection circuit detecting insufficient illumination of said illuminated surface.

However, Lauffenburger teaches a light source (Fig. 2, item 10) that provides illumination onto a surface in response to an optical motion detection circuit detecting insufficient illumination of the surface (see col. 8, lines 6-12).

Regarding claim 21, Liou teaches a method according to the limitations of claim 20 as discussed above, however Liou does not teach a method for determining whether illumination provided by said illuminated surface sufficient for said acquiring said first frame; and provided said illumination provided by said illuminated surface is not

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sufficient for said acquiring said first frame, providing additional illumination onto said illuminated surface.

However, Lauffenburger does teach a method for optimizing illumination in an optical sensing device that comprises determining whether illumination provided by said illuminated surface sufficient for acquiring a first frame (col. 7, line 15-17, and col. 8, lines 6-12, where each flash is considered a “frame” and detection of any frame can be considered a “first frame” relative to the time when a low light level is detected); and provided said illumination provided by said illuminated surface is not sufficient for said acquiring said first frame, providing additional illumination onto said illuminated surface(col. 8, lines 6-12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Lauffenburger in the teachings of Liou to have a supplemental light source integral to the navigation device that could increase the power of said supplemental light source if the detected illumination was deemed too low to improve accuracy in the optical navigation.

5. Claim 5, 8, 13, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liou in view of Mumford (US 6,377,249).

Regarding claims 5 and 13, Liou teaches the limitations of claim 1 and claim 11 as discussed above, however Liou does not teach an internal power source for providing power to said apparatus.

However, Mumford does teach a light pen comprising an internal power source for providing power to said apparatus (Fig. 21, item 216, see col. 16, line 12).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Mumford in the teachings of Liou to have a device that includes a battery as a power supply so that an external power source would not be necessary.

Regarding claims 8 and 16, Liou teaches the limitations of claim 1 and claim 11 as discussed above, however Liou does not teach an apparatus wherein said illuminated surface is a liquid crystal display and wherein said detectable texture comprises pixels of said liquid crystal display.

However, Mumford does teach an light pen system wherein said illuminated surface is a liquid crystal display (col. 1, line 11) and wherein said detectable texture comprises pixels of said liquid crystal display (col. 7, line 62 to col. 8, line 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Mumford in the teachings of Liou to have a detectable texture comprising pixels of a liquid crystal display so that a liquid crystal display device can be used as the illuminated surface.

6. Claims 6 and 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liou in view of Minn (US 4,565,947).

Liou teaches the limitations of claim 1 and claim 11 as discussed above, however, Liou does not teach an apparatus wherein said illuminated surface is a

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cathode ray tube and wherein said detectable texture is a shadow mask of said cathode ray tube.

However, Minn does teach an apparatus for use with a light pen where the illuminated surface is a cathode ray tube (co. 4, line 12) and said detectable texture is a shadow mask of said cathode ray tube (col. 2, lines 56-58).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Minn in the teachings of Liou to have a device that reads the shadow mask of a cathode ray tube so that it can be used directly on the display surface of a cathode ray tube.

7. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liou in view of Ditzik (US 5,771,039).

Liou teaches the limitations of claim 1 and claim 11 as discussed above, however, Liou does not teach an apparatus where the illuminated surface is a liquid crystal display and wherein said detectable texture is a diffuser plate of said liquid crystal display.

However, Ditzik does teach a display device for use with pen/stylus input devices where the illuminated apparatus is a liquid crystal display (Fig. 6A, see col. 7, line 55) and wherein said detectable texture is a diffuser plate of said liquid crystal display (Fig. 6A, item 43, see col. 8, line 64).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Ditzik in the teachings of Liou to

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have a liquid crystal display with a diffuser plate as the illuminated surface in order to utilize a commonly used display device and to have a diffuser to even distribute the backlight over the screen area.

8. Claims 9, 10, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liou in view of Burns (US 5,442,147).

Regarding claims 9 and 16, Liou teaches the limitations of claim 1 and claim 11 as discussed above, however, Liou does not teach an apparatus where wherein said illuminated surface is overlaid with a semi-transparent layer comprising said detectable texture.

However, Burns does teach a position-sensing apparatus comprising an illuminated surface (Fig. 31, item 30) overlaid with a semi-transparent layer (Fig. 31, item 14, see col. 43, lines 59-64) comprising said detectable texture (Fig. 31, item 20, see col. 43, line 59 to col. 44 line 7).

Regarding claim 10 and 18, Burns teaches semi-transparent layer comprising unique positioning information (Fig. 1B, item 15) providing absolute position information of said apparatus relative to said illuminated surface or display screen (see col. 7, lines 10-33).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Burns in the teachings of Liou to have a pattern with a detectable texture overlaid on the illuminated surface in order to

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be able to use an illuminated surface or display screen for optical navigation where there was no pre-existing detectable surface on it already.

Allowable Subject Matter

9. Claims 3, 12, and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter:

Relative to dependent claims 3, 12, and 22, the major difference between the teaching of the prior art of record (Brosnan, US 20040135825; Fernald, US 3,761,877; Satoh, et al. US 5,444,193) and the instant invention is that said prior art does not teach a device “to provide interference reducing illumination onto said illuminated surface in response to said optical motion detection circuit detecting interference caused by said illumination” (see lines 23-26 of claim 3 and lines 23-25 of claim 12) nor a method for “determining whether illumination provided by said illuminated surface interferes with said acquiring said first frame; and provided said illumination provided by said illuminated surface interferes with said acquiring said first frame, providing interference reducing illumination onto said illuminated surface” (see lines 21-26 of claim 22).

Response to Arguments

11. Examiner has fully considered applicant's arguments filed on March 13, 2006, but not all of the arguments were found persuasive.

Applicant argues on page 11 that Liou teaches multiple photo sensor arrays and therefore it does not teach a "single detector" as recited in claim 1. Examiner respectfully disagrees. Liou teaches that sensors 14, 14', 16, 16' as a single array (see col. 3, lines 18). Additionally, applicant's specification refers to a detector as "charged couple device, an amorphous photodiode array, or any other type of array detectors known in the art" (page. 9, middle paragraph, lines 17-20). Therefore, Liou's photo sensor array does constitute a single detector and Liou does not teach away from using a single detector.

Applicant further argues (bottom of page 11) that Liou does not teach using a single detector to acquire a single image at a time. Examiner respectfully disagrees. Liou shows on Fig. 6 a single image made with the combination of the images from individual sensors 14, 14', 16, and 16'. Examiner notes that any photo sensor array is a combination of images captured by each individual sensor on the array. Therefore, since the applicant has explicitly specified that an array may constitute a single detector as discussed above, the combination of images picked up by Liou's photo sensor array, to form a single image as seen in Liou (Fig. 6) falls within the meaning of a single detector acquiring a single image at a time.

Applicant argues on page 11 that Liou's grid pad is not a detectable texture. Examiner respectfully disagrees. Liou teaches a grid that is printed on a plate to form

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grid pad 11 (col. 2, lines 49-52). Therefore, the grid printed on the plate presents a visible texture that is microscopic in nature in regards to depth. Applicant's specification mentions that microscopic textures are included in Applicant's definition of textured surface (page 10, lines 1-15). Therefore, Liou's grid pad is a detectable texture.

Applicant argues on page 9 and on page 17, in regards to claims 6 and 14, that the Gordon reference is non-analogous art. Examiner acknowledges that the patent number indicated in the first office action as "US 4,656,947" was in error. The correct patent number, referring to the Minn as discussed above, is now correctly listed as "US 4,565,947). Due to the examiner's error, the current action will be submitted as a non-final action.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sameer K. Gokhale whose telephone number is (571) 272-5553. The examiner can normally be reached on M-F 8:00 AM - 4:30 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SKG
June 12, 2006

Sameer Gokhale
Examiner
Art Unit 2629



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